

**SAFETY DATA SHEET**

**1. SUBSTANCE AND SOURCE IDENTIFICATION**

**Product Identifier**

**RM Number:** 8469  
**RM Name:** 4,4'-DDT  
**Other Means of Identification:** Not applicable.

**Recommended Use of This Material and Restrictions of Use**

This Reference Material (RM) is intended for use in the evaluation of procedures and working standards in used in the measurement of dichlorodiphenyltrichloroethane (4,4'-DDT) in environmental samples. RM 8469 is provided as a primary reference compound of measured purity for 4,4'-DDT. A unit of RM 8469 consists of one vial containing approximately 100 mg of 4,4'-DDT.

**Company Information**

National Institute of Standards and Technology  
 Standard Reference Materials Program  
 100 Bureau Drive, Stop 2300  
 Gaithersburg, Maryland 20899-2300

Telephone: 301-975-2200  
 FAX: 301-948-3730  
 E-mail: SRMMSDS@nist.gov  
 Website: <http://www.nist.gov/srm>

Emergency Telephone ChemTrec:  
 1-800-424-9300 (North America)  
 +1-703-527-3887 (International)

**2. HAZARDS IDENTIFICATION**

**Classification**

**Physical Hazard:** Not classified.  
**Health Hazard:** Acute Toxicity, Oral, Dermal Category 3  
 Carcinogenicity Category 2  
 STOT, Repeated exposure Category 1

**Label Elements**  
**Symbol**



**Signal Word**  
 DANGER

**Hazard Statement(s):**

H301+H311 Toxic if swallowed or in contact with skin.  
 H351 Suspected of causing cancer.  
 H372 Causes damage to organs <central nervous system> through prolonged or repeated exposure <ingestion>.

**Precautionary Statement(s):**

P201 Obtain special instructions before use.  
 P202 Do not handle until all safety precautions have been read and understood.  
 P260 Do not breathe dust.  
 P264 Wash hands thoroughly after handling.  
 P270 Do not eat, drink or smoke when using this product.  
 P280 Wear protective gloves, protective clothing, and eye protection.  
 P301+P310 If on skin: Wash with plenty of water.  
 P361+P364 Take off immediately all contaminated clothing and wash it before reuse.

P301+P310 If swallowed: Immediately call a doctor.  
P330 Rinse mouth.  
P312 Call a doctor.  
P405 Store locked up.  
P501 Dispose of contents and container according to local regulations.

**Hazards Not Otherwise Classified:** Not applicable.

**Ingredients(s) with Unknown Acute Toxicity:** Not applicable.

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### 3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

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**Substance:** 4,4'-DDT

**Other Designations:** DDT; *p,p'*-DDT; 1,1'-(2,2,2-trichloroethylidene)bis(4-chlorobenzene); dicophane; 1,1,1-trichloro-2,2-bis(p-chlorophenyl)ethane; alpha,alpha-bis(p-chlorophenyl)-beta,beta,beta-trichloroethane; pentachlorin; RCRA U061; C<sub>14</sub>H<sub>9</sub>Cl<sub>5</sub>.

Components listed below are in compliance with OSHA's 29 CFR 1910.1200.

Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
4,4'-DDT	50-29-3	200-024-3	99.8

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### 4. FIRST AID MEASURES

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**Description of First Aid Measures:**

**Inhalation:** If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

**Skin Contact:** Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

**Eye Contact:** Flush eyes with water for at least 15 minutes. Then get immediate medical attention.

**Ingestion:** If swallowed, drink plenty of water, do NOT induce vomiting. Get immediate medical attention. Induce vomiting only at the instructions of a physician. Do not give anything by mouth to unconscious or convulsive person.

**Most Important Symptoms/Effects, Acute and Delayed:** Organochlorine pesticides cause liver and kidney damage.

**Indication of any immediate medical attention and special treatment needed, if necessary:** If any of the above symptoms are present, seek medical attention if needed.

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### 5. FIRE FIGHTING MEASURES

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**Fire and Explosion Hazards:** Slight fire hazard. See Section 9, "Physical and Chemical Properties" for flammability properties.

**Extinguishing Media:**

Suitable: Regular dry chemical, water, and regular foam.

Unsuitable: None listed.

**Specific Hazards Arising from the Chemical:** None listed.

**Special Protective Equipment and Precautions for Fire-Fighters:** Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

**NFPA Ratings** (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 2                  Fire = 1                  Reactivity = 0

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### 6. ACCIDENTAL RELEASE MEASURES

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**Personal Precautions, Protective Equipment and Emergency Procedures:** Any accumulated material on surfaces should be removed and properly disposed of. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

**Methods and Materials for Containment and Clean up:** Do not touch spilled material. Notify safety personnel of spills. Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Isolate hazard area and deny entry. Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.

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## 7. HANDLING AND STORAGE

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**Safe Handling Precautions:** Minimize dust generation and accumulation on surfaces. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. See Section 8, "Exposure Controls and Personal Protection".

**Storage:** Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances (See Section 10, "Stability and Reactivity").

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## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

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### Exposure Limits:

ACGIH (TLV): 1 mg/m<sup>3</sup> (TWA)

NIOSH (REL): 0.5 mg/m<sup>3</sup> (TWA)  
500 mg/m<sup>3</sup> (IDLH)

OSHA (PEL): 1 mg/m<sup>3</sup> (TWA)  
Prevent or reduce skin absorption.

**Engineering Controls:** Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

**Personal Protection:** In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

**Respiratory Protection:** If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

**Eye/Face Protection:** Wear splash resistant safety goggles with a face shield. An eye wash station should be readily available near areas of use.

**Skin and Body Protection:** Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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### Descriptive Properties:

#### Appearance

(physical state, color, etc.):

#### Molecular Formula:

#### Molar Mass (g/mol):

#### Odor:

#### Odor threshold:

#### pH:

#### Evaporation rate:

#### Melting point/freezing point:

#### Specific Gravity (water=1):

#### Vapor Pressure (mmHg):

#### Vapor Density (air = 1):

#### Viscosity (cP):

#### Solubility(ies):

#### Partition coefficient (n-octanol/water):

#### Particle Size:

### 4,4'-DDT

white crystalline solid

C<sub>14</sub>H<sub>9</sub>Cl<sub>5</sub>

354.49

not available

not available

not available

not applicable

107 °C to 109 °C

(224.6 °F to 228.2 °F)

1.56 at 15 °C

not available

not applicable

not applicable

insoluble in water (0.12 ppm at 25 °C),  
soluble in acetone, ether, pyridines, kerosene,  
benzene, carbon tetrachloride, dioxane, chloroform,  
and organic solvents

not available

not available

<b>Thermal Stability Properties:</b>	<b>4,4' DDT</b>
<b>Autoignition Temperature (°C):</b>	not available
<b>Thermal Decomposition (°C):</b>	not available
<b>Initial boiling point and boiling range (°C):</b>	260 °C (500 °F)
<b>Explosive Limits, LEL (Volume %):</b>	not available
<b>Explosive Limits, UEL (Volume %):</b>	not available
<b>Flash Point (°C):</b>	not available
<b>Flammability (solid, gas):</b>	not available

## 10. STABILITY AND REACTIVITY

**Reactivity:** Stable at normal temperatures and pressure.

**Stability:**      X      Stable              Unstable

**Possible Hazardous Reactions:** None listed.

**Conditions to Avoid:** Avoid heat, flames, sparks and other sources of ignition. Keep out of water supplies and sewers.

**Incompatible Materials:** Bases, combustible materials, metal salts, metals, and oxidizing materials.

**Fire/Explosion Information:** See Section 5, "Fire Fighting Measures".

**Hazardous Decomposition:** Thermal decomposition will produce chlorides and oxides of carbon.

**Hazardous Polymerization:**           Will Occur      X   Will Not Occur

## 11. TOXICOLOGICAL INFORMATION

**Route of Exposure:**      X   Inhalation      X   Skin      X   Ingestion

**Symptoms Related to the Physical, Chemical and Toxicological Characteristics:** Nausea, vomiting, diarrhea, stomach pain, and headache.

**Potential Health Effects (Acute, Chronic and Delayed):**

**Inhalation:** Same as ingestion if sufficient amounts are absorbed through the lungs.

**Skin Contact:** Same as ingestion if sufficient amounts are absorbed through the skin.

**Eye Contact:** May cause eye irritation.

**Ingestion:** Oral ingestion of food is the primary source of exposure for the general population. Acute and chronic ingestion was cause nausea, vomiting, diarrhea, stomach pain, headache, dizziness, disorientation, tingling sensation, kidney damage, liver damage, convulsions, coma, and death. 4,4'-DDT may cross the placenta and can be excreted in breast milk.

**Numerical Measures of Toxicity:**

**Acute Toxicity:** Category 3, Oral, Dermal

Rat, Oral LD50: 87 mg/kg

Rabbit, Dermal LD50: 300 mg/kg

**Skin Corrosion/Irritation:** Not classified; no data available.

**Serious Eye Damage/Irritation:** Not classified.

Human, Eye: 423 mg/m<sup>3</sup> for 1 h day for 6 d (irritation)

**Respiratory Sensitization:** Not classified; no data available.

**Skin Sensitization:** Not classified; no data available.

**Germ Cell Mutagenicity:** Not classified; no data available.

**Carcinogenicity:** Category 2

**Listed as a Carcinogen/Potential Carcinogen**      X   Yes           No

4,4'-DDT is listed by IARC as Group 2B (possibly carcinogenic to humans) and by NTP as *Reasonably Anticipated To Be A Human Carcinogen*. It is not listed by OSHA as a carcinogen/potential carcinogen.

Tumorigenic effects: Rat, Oral TD: 438 mg/kg (2 years)

Mutagenic effects: Human, 200 µg/L (72 h)

**Reproductive Toxicity:** Not classified; no data available.  
Rat, Oral, TDL<sub>o</sub>: 430 mg/kg (pregnant 1 d to 21 d, 21 d).

**Specific Target Organ Toxicity, Single Exposure:** Not classified; no data available.

**Specific Target Organ Toxicity, Repeated Exposure:** Category 1, prolonged or repeated exposure may damage the central nervous system.

**Aspiration Hazard:** Not classified; no data available.

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## 12. ECOLOGICAL INFORMATION

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### Ecotoxicity Data:

Fish Toxicity: Rainbow trout (*Oncorhynchus mykiss*) LC<sub>50</sub> [static]: 1.25 µg/L to 3.59 µg/L (96 h)  
Invertebrate: Water flea (*Daphnia magna*) LC<sub>50</sub> [static]: 0.000 46 mg/L to 0.001 mg/L (48 h)

**Persistence and Degradability:** No data available.

**Bioaccumulative Potential:** BCF 1.17 species: fish.

**Mobility in Soil:** No data available.

**Other Adverse effects:** No data available.

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## 13. DISPOSAL CONSIDERATIONS

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**Waste Disposal:** Dispose of waste in accordance with all applicable federal, state, and local regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): U061.

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## 14. TRANSPORTATION INFORMATION

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**U.S. DOT and IATA:** UN2761, Organochlorine pesticide, solid, n.o.s. (4,4'-DDT); Hazard class 6.1, PG III, Excepted Quantity: E1.

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## 15. REGULATORY INFORMATION

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### U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): 1 lb (0.454 kg) final RQ.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH:	Yes.
CHRONIC HEALTH:	Yes.
FIRE:	No.
REACTIVE:	No.
PRESSURE:	No.

### State Regulations:

California Proposition 65: WARNING! This product contains a chemical (4,4'-DDT) known to the state of California to cause cancer and reproductive/developmental effects.

**U.S. TSCA Inventory:** Listed.

**TSCA 12(b), Export Notification:** Section 5, 0.1 % de minimus concentration.

### Canadian Regulations:

WHMIS Information: Not provided for this material.

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## 16. OTHER INFORMATION

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**Issue Date:** 28 May 2015

**Sources:** ChemADVISOR, Inc., SDS *Dichlorodiphenyltrichloroethane*, 20 March 2015.

### Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NRC	Nuclear Regulatory Commission
ALI	Annual Limit on Intake	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EC50	Effective Concentration, 50 %	RM	Reference Material
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transportation Agency	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration, 50 %	STEL	Short Term Exposure Limit
LD50	Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	WHMIS	Workplace Hazardous Materials Information System

**Disclaimer:** Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The reference values for this material are given in the NIST Report of Investigation.

Users of this RM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail [srmmsds@nist.gov](mailto:srmmsds@nist.gov); or via the Internet at <http://www.nist.gov/srm>.